

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application and reflects the amendment of claims 1, 3, 4, 6, 10 and 12, and the addition of new claims 13-20.

Listing of Claims:

1. (Currently Amended) An optical connector equipped with a shutter, comprising:

a connector housing ~~which is~~ formed with a connector hole into which an optical connector is inserted and connected and within which said optical connector and a connection reception side optical connector are connected together, and ~~within which a~~ separate shutter unit assembly is provided assembled in a shutter unit receiving portion formed within said connector housing; wherein:

said shutter unit assembly comprises a main section which is fitted within said shutter unit receiving portion ~~to~~ of said connector housing and a plurality of tongue leaf shaped shutter leaves which are linked to said main section in the vicinity of the interior surface of said connector hole, and which, by being arranged so as to project from said main section into said connector hole, intercept light which is emitted from an optical fiber which is exposed at the tip end of said connection reception side optical connector;

said shutter leaves are provided in said connector housing as linked to said main section so as to be changeable over by rotational displacement with respect to said main section about linking sections as axes between light interception positions in which they project from said linking sections into said connector hole, and retracted positions in which, by said optical connector being inserted into said connector hole, they are pressed down so as to reduce the amounts by which they project into said connector hole, so as to allow connection of said optical connector to said connection reception side optical connector; and

when said shutter leaves are in said light interception position, said shutter leaves are mutually overlapped over one another so as to close said connector hole.

2. (Original) An optical connector equipped with a shutter as described in Claim 1, wherein, in said connector hole of said connector housing, in the vicinity of the position of connection between said optical connector and said connection reception side optical connector, there is provided a shielding member which is endowed with electrical conductivity, and a window is formed in said shielding member, through which a ferrule of said optical connector tip end and/or a ferrule of said connection reception side optical connector tip end can be inserted.

3. (Currently Amended) A shutter unit, comprising:

a main section which is fitted within a shutter unit receiving portion formed within ~~assembled to~~ a connector housing, which housing is formed with a connector hole into which an optical connector is inserted and connected and within which said optical connector and a connection reception side optical connector are connected together, and a plurality of tongue leaf shaped shutter leaves which are arranged so as to project from said main section into said connector hole of said connector housing; wherein:

said main section comprises a main plate portion which is formed with a window into which said optical connector and/or said connection reception side optical connector can be inserted and which is provided within said connector housing and orientated to cut across said connector hole with said window communicating said connector hole, and a pair of extended portions which are extended so as to rise up towards one side of said main plate portion from both opposite edges of said main plate portion; and

said shutter leaves are linked to said extended portions so as to be changeable over by rotational displacement with respect to said extended portions about linking sections as axes between light interception positions in which they project from said linking sections into a space between said pair of extended portions, and retracted positions in which, by being

pressed down, they are positioned so as to extend from said linking sections towards the side of said main plate portion;

and moreover resilient members which are provided by said linking sections themselves, or alternatively which are provided separately from said linking sections, are arranged to function, when said shutter leaves have been rotationally displaced from their said light interception positions, as pressing and returning biasing members for pressing and returning said shutter leaves back to their said light interception positions, and, when both said shutter leaves are in their said light interception positions, said shutter leaves are mutually overlapped over one another so as to close said connector hole.

4. (Currently Amended) An optical connector equipped with a shutter, comprising:

a connector housing which is formed with a connector hole into which an optical connector is inserted and connected and within which said optical connector and a connection reception side optical connector are connected together, and ~~within which a~~ separate shutter unit assembly is provided assembled in a shutter unit receiving portion formed within said connector housing, wherein:

said shutter unit assembly comprises a main section which is fitted within said shutter unit receiving portion of ~~assembled to~~ said connector housing and a plurality of tongue leaf shaped shutter leaves which are arranged so as to project from said main section into said connector hole of said connector housing, wherein:

said main section comprises a main plate portion which is formed with a window into which said optical connector and/or said connection reception side optical connector can be inserted and which is provided within said connector housing and orientated to cut across said connector hole with said window communicating said connector hole, and a pair of extended portions which are extended so as to rise up towards one side of said main plate portion from both opposite edges of said main plate portion; and

said shutter leaves are linked to said extended portions so as to be changeable over by rotational displacement with respect to said extended portions about linking sections as axes between light interception positions in which they project from said linking sections into a space between said pair of extended portions, and retracted positions in which, by being pressed down, they are positioned so as to extend from said linking sections towards the side of said main plate portion;

and moreover resilient members which are provided by said linking sections themselves, or alternatively which are provided separately from said linking sections, are arranged to function, when said shutter leaves have been rotationally displaced from their said light interception positions, as pressing and returning biasing members for pressing and returning said shutter leaves back to their said light interception positions, and, when both said shutter leaves are in their said light interception positions, said shutter leaves are mutually overlapped over one another so as to close said connector hole.

5. (Original) An optical connector equipped with a shutter as described in Claim 4, wherein, in said connector hole of said connector housing, in the vicinity of the position of connection between said optical connector and said connection reception side optical connector, there is provided a shielding member which is endowed with electrical conductivity, and a window is formed in said shielding member, through which a ferrule of said optical connector tip end and/or a ferrule of said connection reception side optical connector tip end can be inserted.

6. (Currently Amended) An optical connector equipped with a shutter, comprising:

a connector housing which is formed with a connector hole into which an optical connector is inserted and connected and within which said optical connector and a connection reception side optical connector are connected together, and ~~within which a separate shutter unit assembly is positioned assembled~~ within a shutter unit receiving

portion formed within said connector housing to which intercepts light emitted from said connection reception side optical connector ~~is assembled~~; wherein:

said shutter unit assembly comprises a main section which is fitted within said shutter unit receiving portion of ~~to~~ said connector housing and a plurality of tongue leaf shaped shutter leaves which, by projecting from said main section into said connector hole, are arranged to be capable of intercepting light which is emitted from an optical fiber which is exposed at the tip end of said connection reception side optical connector; and

said shutter leaves comprise light interception plate portions which are assembled to said connector housing and are arranged in positions to oppose a junction end face of said connection reception side optical connector tip end, and connector contacting portions which are pressed by a portion of said optical connector, when it is inserted in said connector hole, other than said junction end face thereof; so that:

by said connector contacting portions being pressed by said optical connector, they are pressed down so that the amounts by which they project within said connector hole are reduced, so as to enable the connection of said optical connector to said connection reception side optical connector; and moreover, when said optical connector is contacted against said connector contacting portions, a non contacting state of said light interception plate portions with respect to said junction end face of said optical connector is maintained.

7. (Original) An optical connector equipped with a shutter as described in Claim 6, wherein, in said connector housing, a pair of said shutter leaves are provided, and the positions where said shutter leaves are linked to said main section are positions on both sides of the central axis of the connector hole of the connector housing, with said shutter leaves being provided so as to project from their said positions where they are linked with said main section into said connector hole, and so as to mutually overlap with one another so as to close up said connector hole.

8. (Original) An optical connector equipped with a shutter as described in Claim 7, wherein, as said connector contacting portions, projecting portions are formed upon said shutter leaves which project in the opposite direction to the direction in which said shutter leaves are pressed down by said optical connector; and

said light interception plate portions are positioned at locations which are shifted forward in the pressing down direction of said shutter leaves by said optical connector, as compared to said connector contacting portions.

9. (Original) An optical connector equipped with a shutter as described in Claim 6, wherein, as said connector contacting portions, projecting portions are formed upon said shutter leaves which project in the opposite direction to the direction in which said shutter leaves are pressed down by said optical connector; and

said light interception plate portions are positioned at locations which are shifted forward in the pressing down direction of said shutter leaves by said optical connector, as compared to said connector contacting portions.

10. (Currently Amended) An optical connector equipped with a shutter, comprising:

a connector housing ~~which is formed~~ with a connector hole into which an optical connector is inserted and connected and within which said optical connector and a connection reception side optical connector are connected together, ~~and within which are assembled a separate shutter unit; assembly positioned within a shutter unit receiving portion formed within said connector housing to which~~ intercepts light which is emitted from said connection reception side optical connector, and an inner piece; wherein:

in the interior of said connector housing, there are formed an engagement claw which engages with said optical connector which has been inserted into said connector hole of said connector housing, and long grooves which extend along the axial direction of said connector hole on both sides of said engagement claw;

said inner piece is provided in the vicinity of the connection position between said optical connector and said connection reception side optical connector, and comprises an inner main section which is formed with an aperture into which a ferrule which projects at a tip end of said optical connector and/or a ferrule which projects at a tip end of said connection reception side optical connector can be inserted, and a plurality of projections which project from said inner main section towards the side of said optical connector insertion aperture of said connector housing; and

said projections of said inner piece are inserted in said long grooves of said connector housing.

11. (Original) An optical connector equipped with a shutter as described in Claim 10, wherein said inner piece is formed from a material which has an electromagnetic radiation shielding capability, and said inner main section of said inner piece functions as an electromagnetic radiation shielding member due to the action of said electromagnetic radiation shielding material which is provided to said inner main section.

12. (Currently Amended) An inner piece which is assembled to a connector housing which is provided with a connector hole into which an optical connector is inserted and connected and within which said optical connector and a connection reception side optical connector are connected together, said inner piece comprising an inner main section which is formed with an aperture into which a ferrule which projects at a tip end of said optical connector and/or a ferrule which projects at a tip end of said connection reception side optical connector can be inserted and which is located within said connector housing in the vicinity of the connection position between said optical connector and said connection reception side optical connector, and a plurality of projections which project from said inner main section; and wherein:

said projections are engaged into long grooves which are formed along the axial direction of said connector hole on both sides of an engagement claw for engaging said

optical connector to said connector housing, thus assembling said inner piece within said connector housing.

13. (New) An optical connector according to claim 1, wherein said shutter unit assembly is endowed with electrical conductivity.
14. (New) An optical connector according to claim 2, wherein said window formed in said shielding member has a smaller area than the area of the opening of said connector hole.
15. (New) An optical connector according to claim 3, wherein said shutter unit is endowed with electrical conductivity.
16. (New) An optical connector according to claim 4, wherein said shutter unit assembly is endowed with electrical conductivity.
17. (New) An optical connector according to claim 5, wherein said window formed in said shielding member has a smaller area than the area of the opening of said connector hole.
18. (New) An optical connector according to claim 6, wherein said shutter unit assembly is endowed with electrical conductivity.
19. (New) An optical connector according to claim 10, wherein said aperture formed in said inner main section has a smaller area than the area of the opening of said connector hole.
20. (New) An optical connector according to claim 12, wherein said aperture formed in said inner main section has a smaller area than the area of the opening of said connector hole.